

Notice of Allowability

Application No.

10/691,838

Examiner

Paul W. Schlie

Applicant(s)

GUHA ET AL.

Art Unit

2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to examiner interview dated 7/11/06, and resulting amended claims dated 7/13/06.
2. ☒ The allowed claim(s) is/are 10-12, 14-42.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

2. Authorization for this examiner's amendment was given in a telephone interview with Charles Kulas on 7/13/06 and authorized 7/26/06, whereby:

Claims 10, 14, 25, 36 and 41-42 are further amended; and

Claims 11-12, 15-24, 26-35, and 37-40 remain as previously presented; and

Claims 1-9 and 13 are canceled.

3. The application's claims 10, 13, 14, 25, 36 and 41-42 are amended as follows:

10. (Currently Amended) A method for allocating storage resources in a system including a data storage system controller coupled to a data storage system, the method comprising:

determining workload parameters, wherein the workload parameters include a determined access pattern of the workload;

determining data storage system parameters, wherein the data storage system parameters include a determined current I/O load per data storage unit;

13. (Canceled) [BY THIS AMENDMENT]

14. (Currently Amended) The method as recited in claim 10 wherein ~~the step of~~ determining the data storage system parameters comprises ~~the steps of:~~

determining current storage utilization per data storage unit for each data storage unit in the data storage system;

~~determining current I/O load per data storage unit for each data storage unit in the data storage system; and~~

determining I/O bandwidth per data storage unit.

25. (Currently Amended) A method for configuring I/O performance and power consumption of a data storage system on receipt of a request for writing data, the I/O performance being measured in terms of the I/O rate, the data storage system comprising a plurality of data storage units and a data storage unit controller, each of the plurality of data storage units comprising multiple disk drives, the data being written on to the disk drives, the method comprising:

~~determining workload parameters, the workload parameters characterizing the workload imposed onto the data storage system, wherein the workload parameters include a determined access pattern of the workload;~~

~~determining data storage system parameters, the data storage system parameters characterizing the data storage system, wherein the data storage system parameters include a determined current I/O load per data storage unit;~~

identifying target data storage units for writing the data; and

if a volume of data to be written is greater than a threshold volume then writing data using a non-power managed configuration else writing data using a power managed configuration.

36. (Currently Amended) A method for handling a write request in a data storage system, the method comprising the following actions performed by a processor:

receiving the write request, wherein the write request specifies an amount of data to be written;

comparing the amount of data to a condition comprising:

determining workload parameters, wherein the workload parameters include a determined access pattern of the workload;

determining data storage system parameters, wherein the data storage system parameters include a determined current I/O load per data storage unit;

writing the amount of data in a power managed organization scheme if the condition is met; and

writing the amount of data in a non-power managed organization scheme if the condition is not met.

41. (Currently Amended) A storage controller for handling a write request in a data storage system, the storage controller comprising:

a processor;

a machine-readable storage medium including instructions executable by the processor for performing the method of claim 36 receiving the write request, wherein the write request specifies an amount of data to be written;

comparing the amount of data to a condition;

writing the amount of data in a power managed organization scheme if the condition is met; and

writing the amount of data in a non-power managed organization scheme if the condition is not met.

42. (Currently Amended) A machine-readable storage medium including instructions executable by a processor for handling a write request in a data storage system, the machine-readable medium comprising one or more instructions for performing the method of claim 36 receiving the write request, wherein the write request specifies an amount of data to be written;

comparing the amount of data to a condition;

writing the amount of data in a power managed organization scheme if the condition is met; and


writing the amount of data in a non-power managed organization scheme if the condition is not met.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul W. Schlie whose telephone number is 571-272-6765. The examiner can normally be reached on Mon-Thu 8:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached on 517-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


PIERRE BATAILLE
PRIMARY EXAMINER
8/2/06